The Design

- Resembles a sail
- Shipping history
- Dubai monument
- Built on private island
- Tallest hotel in the world
- Underwater restaurant only accessible by submarine

- Architecture Firm: W.S. Atkins
- Based in Surrey, England
- Project Lead Architect Tom Wright
- Engineering Firm: Al Habtoor
- Construction began 1994 with planning and was completed in 1999
The Structure

- Exoskeleton Frame
The Structure

- Trusses
The Structure

- Central Spine
The Structure

• Membrane
In Construction

• Concrete Superstructure
In Construction

• Bracing
Analysis - Trusses

- Braces steel frame diagonally
- Resists Lateral Loads
- Reduce Moment and Deflection
Analysis-Bracing

- Braces the exterior steel frame
- Resists Lateral Loads
- Resists Overturning
Lateral loads are transferred from steel frame to central spine

Spine unifies the steel and concrete structures
Whole loads are first passed from reinforced concrete in multistory frame to main steel exoskeleton, and then to the foundation.
Lateral Loads
Moment Diagram

Without Bracing

With Bracing
Atrium Membrane

- Façade for world's tallest atrium
- Material – Teflon coated Fiberglass
- Supported on arched trusses
- Trusses supported by cross braced steel rods
- Anchored at the bottom, mezzanine at the top
- Reduces glare and allows diffused lighting into atrium
The Foundation

- Foundation is a piled raft
- 250 bored piles using friction
- Each is 1.5m and 35m long
- Bored through sand
- Resists earthquakes
The References

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